WRIGHT-PATTERSON AIR FORCE BASE, AREA B, BUILDING 71, POWER PLANT ENGINE TEST TORQUE STANDS
DAYTON VIC.
GREENE COUNTY
OHIO

HAER Nº. OH-79-AX

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PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

Historic American Engineering Record
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HISTORIC AMERICAN ENGINEERING RECORD

WRIGHT-PATTERSON AIR FORCE BASE, AREA B,
BUILDING 71, POWER PLANT ENGINE TEST TORQUE STANDS
HAER No. OH-79-AX

Location: Along 7th Street between D and G Streets; Wright-Patterson Air Force Base, Area B, Dayton Vicinity, Greene County, Ohio.

Dates of Construction: 1932.

Present Owner: USAF.

Present Use: Support facility for the Materials Directorate Laser Hardened Materials Test Facility.

Significance: Building 71 is part of the Power Plant Laboratory Complex, the site of essential aircraft engine research and development, particularly during the 1930s and '40s. It was the location of Wright Field's first permanent engine test cells. Other structures in the complex were built due to the increased research demands of World War II.

Project History: This report is part of the overall Wright-Patterson Air Force Base, Area B documentation project conducted by HAER 1991-1993. See overview report, HAER No. OH-79, for a complete description of the project.

DESCRIPTION: Building 71 is a monumental concrete structure consisting of ten 40' stacks designed to accommodate seven torque stands--six for engine endurance tests and one for propeller tests. The concrete stacks are connected to each other by enclosed passages. The building is of symmetrical design with repetitive tubular steel sound baffles emerging from the top above each torque stand. Originally open to the sky, the baffles are now enclosed. Each engine support pier consists of a block of concrete sunk 20' into the ground and encased completely in cork to absorb the intense vibration generated during engine and propeller endurance testing.

HISTORY: The Power Plant Engine Test Torque Stands (Building 71) were completed in 1932, replacing two temporary engine test cells constructed in 1927. In attempting to increase the power output and durability of engines, the seven torque stands performed crucial performance and endurance tests lasting up to 150 hours at a time. The tests also helped develop new types of engines, improve fuels, and extend supercharging to higher powers and altitudes. In the late 1940s Test Cells 1 and 2 were modified to Turbo-Prop engines and Test Cells 3, 4, 5 and 6 were converted to Turbo-Jet Engine Cells, and later had exhaust mufflers installed to reduce engine noise. During the 1960s 3, 4 and 5 stands were primarily used to conduct engine oil qualification tests using J-56 and J79 engines. In 1963 the Inertial Starter Test Rig was installed in Test Cell 7. This Test Rig had a variable inertial load capability for performance testing of various jet engine starters (electric, air, combustion and cartridge). In 1967 No. 1 Stand was modified to become the Magneto Hydrodynamics Research Facility. In the 1990s Building 71 no longer houses engine testing, and is now used by the Materials Directorate in a support capacity for its Laser Hardened Materials Test Facility.

For bibliography, see Wright-Patterson Air Force Base overview report (HAER No. OH-79).